

R E M A R K S

Claims 1, 10 and 13 to 17 as set forth in Appendix II of this paper are currently pending in this case. Claims 2 to 5, 8, 9, 11 and 12 have been canceled, Claims 1 and 10 have been amended, and Claims 13 to 17 have been added as indicated in the Listing of Claims set forth in Appendix I of this paper.

Accordingly, applicants have amended Claim 1 to relate to a method wherein a pest selected from the order of Isoptera, Hymenoptera, Orthoptera and Psocoptera is controlled using an effective amount of a compound of formula (I-1) wherein Y represents one to five substituents selected from cyano and nitro. Claim 10 has been amended to include the application rate in accordance with applicants' disclosure on page 26, indicated lines 18 to 23, of the application. New Claim 13 relates to the method of Claim 1 wherein compound No 44 is employed, and new Claim 14 further specifies the pest referenced in Claim 1 as an ant or termite in accordance with applicants' disclosure on page 23, indicated lines 5 to 9 and indicated lines 20 to 24, of the application. New Claim 15 more specifically defines the method as addressed on page 23, indicated lines 5 to 19, of the application, and new Claim 16, correspondingly defines the method addressed on page 23, indicated lines 20 to 29, of the application. New Claim 17 further specifies the method of Claim 16 corresponding to applicants' disclosure on page 26, indicated lines 18 to 23, of the application. No new matter has been added.

The Examiner has rejected Claims 1 to 5, 8, 10 and 12 under 35 U.S.C. §112, ¶2. More particularly, the Examiner states "'Effective' is not identified as to what effective for; 'combating' is not identified as what is intended attracting, repelling can be combating".

However, the "distinctly claim" requirement of 35 U.S.C. §112, ¶2, means that the claims must have a clear and definite meaning when construed in the light of the complete patent document<sup>1)</sup>, and the test of definiteness is whether a person having ordinary skill in the pertinent art would understand the bounds of the claim when reading it in the light of the supporting specification<sup>2)</sup>. Also, the degree of

1) Standard Oil Co. v. American Cyanamid Co., 774 F.2d 448, 227 USPQ 293 (CAFC 1985)

2) Morton Int. Inc. v. Cardinal Chem. Co., 5 F.3d 1464, 28 USPQ2d 1190 (CAFC 1993); Orthokinetics Inc. v. Safety Travel Chairs, Inc., 806 F.2d 1565, 1 USPQ2d 1081 (CAFC 1986)

precision which is necessary to meet the definiteness requirement of Section 112, ¶2, is a function of the subject matter which is claimed<sup>3)</sup>. Just as an application need not teach, and preferably omits, that which is well known in the art<sup>4)</sup>, it is not necessary for a claim to define terms conventionally used in the art. Moreover, as explained in Ex parte Wu (10 USPQ2d 2031 at 2033 (BPAI 1989))

*In rejecting a claim under the second paragraph of 35 U.S.C. 112, it is incumbent on the examiner to establish that one of ordinary skill in the pertinent art, when reading the claims in light of the supporting specification, would not have been able to ascertain with reasonable degree of precision and particularity the particular area set out and circumscribed by the claims.*

(emphasis added)<sup>5)</sup>. The Examiner has not given any reasons why a person of ordinary skill in the pertinent art would not be able to ascertain the meaning of the respective expressions when reading the claims in light of the supporting disclosure. It is also respectfully noted that there is absolutely no legal proscription against "functional" language in a claim<sup>6)</sup>. In fact the CCPA has held that the "functional" limitation "effective amount" admirably states what is to be derived from the disclosure of the specification<sup>7)</sup>. It is therefore respectfully solicited that the rejection under the provisions of Section 112, ¶2, be withdrawn. Favorable action is solicited.

The Examiner has rejected Claims 1 to 5 and 8 to 12 under 35 U.S.C. §102(b) as being anticipated by the disclosure of Toki et al. (EP 500 111) and by the disclosure of Harrison et al. (WO 92/06076). Favorable reconsideration of the Examiner's position is solicited in light of the attached and the following.

Anticipation under Section 102 can be found only if a reference shows exactly what is claimed<sup>8)</sup>. The test for anticipation is one of

3) Hybritech Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 231 USPQ 81 (CAFC 1986); Miles Labs., Inc. v. Shannon, Inc., 997 F.2d 870, 27 USPQ2d 1123 (CAFC 1993)

4) Hybritech, Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 231 USPQ 81 (CAFC 1986)

5) Note also Ex parte Cole et al. (223 USPQ 94 (POBA 1983)): "Claims are addressed to the person of average skill in the particular art. Compliance with Section 112 must be adjudged from that perspective, not in a vacuum."

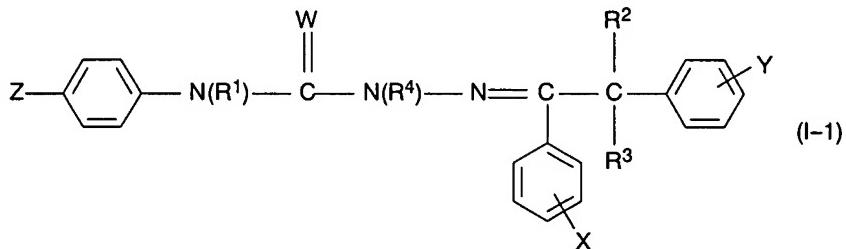
6) For example, In re Miller (441 F2d 689, 169 USPQ 597 (CCPA 1971)), Ex parte Ponsford (575 PTCJ A-13 (Bd.Pat.App. 1982)) and Ex parte Roggenburk (172 USPQ 82 (Bd.Pat.App.)).

7) In re Caldwell (319 F.2d 254, 138 USPQ 243 (CCPA 1963))

8) ie. Titanium Metals Corp. v. Banner, 778 F.2d 775, 227 USPQ 773 (CAFC 1985); In re Marshall 577 F.2d 301, 198 USPQ 344 (CCPA 1978); In re Kalm 378 F.2d 959, 154 USPQ 10 (CCPA 1967)

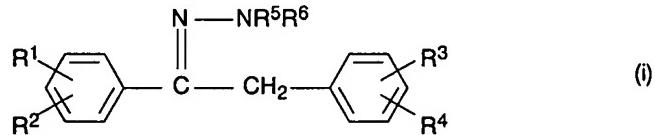
identity, and the identical invention must be shown in the reference in as complete detail as is contained in the claim<sup>9)</sup>. In fact, the Federal Circuit has stated that it is error to treat claims as a catalog of separate parts, in disregard of the part-to-part relationships set forth in the claims that give those claims their meaning<sup>10)</sup>. Also, the mere fact that a claimed compound may be encompassed by a generic formula which is disclosed in a reference does not by itself render the claimed compounds obvious<sup>11)</sup>. Accordingly, the mere fact that a claimed species falls within the broad disclosure of a reference is not enough to establish anticipation within the meaning of Section 102.

Applicants' invention relates to a method of controlling an ant or termite from the order of Isoptera, Hymenoptera, Orthoptera and Psocoptera which comprises the application of an effective amount of a compound of formula (I-1)



wherein Y represents 1 to 5 same or different substituents selected from the group consisting of nitro and cyano.

The disclosure of *Toki et al.* relates to pesticidal compounds represented by generic formula (i):



The variables R<sup>1</sup> to R<sup>4</sup>, each of which represents a broad variety of radicals, are inter alia defined as a nitro group or a cyano group, excluding, however, cases where at least one of R<sup>1</sup> to R<sup>4</sup> is a nitro

9) ie. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1913 (CAFC 1989)

10) ie. *Lindemann Maschinenfabrik v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481 (CAFC 1984)

11) ie. *In re Baird*, 16 F.3d 380, 29 USPQ2d 1550 (CAFC 1994); see also *Corning Glass Works v. Sumitomo Electric U.S.A.*, 868 F.2d 1251, 9 USPQ2d 1962 (CAFC 1989), which holds that a genus does not inherently disclose all species; and *In re Jones*, 958 F.3d 347, 21 USPQ2d 1614 (CAFC 1992), which holds that a genus does not render all species that happen to fall within the genus obvious.

group<sup>12)</sup>, and the variables R<sup>5</sup> and R<sup>6</sup>, among a broad variety of radicals, are inter alia defined as a carbamoyl group which may be substituted<sup>13)</sup>.

While it is possible to construe applicants' formula (I-1) by selectively picking and choosing the "right" denotations for the variables R<sup>1</sup> to R<sup>6</sup>, there is certainly nothing in the teaching of *Toki et al.* which would guide a person of ordinary skill in the art to make the selection which is necessary to arrive at applicants' formula (I-1). Nor is there any exemplary compound disclosed by *Toki et al.* which identically shows the requirements characterizing applicants' formula (I-1). Accordingly, the disclosure of *Toki et al.* clearly fails to identically show the invention which is defined in applicants' claims, and falls short from amounting to an anticipating disclosure within the meaning of Section 102. The features and requirements which characterize applicants' formula (I-1) are a part of each of applicants' Claims 1, 10 and 13 to 17, so that the foregoing applies to all of the claims herewith presented. It is respectfully requested that the rejection under 35 U.S.C. §102(b) be withdrawn.

It is further respectfully submitted that the disclosure of *Toki et al.* cannot be considered to render applicants' method *prima facie* obvious within the meaning of Section 103(a). It is well settled that obviousness within the meaning of Section 103(a) requires that the prior art provides some incentive or motivation which suggests the desirability of the particular changes which are necessary to arrive at the claimed invention<sup>14)</sup>. The disclosure of *Toki et al.* does not provide the requisite incentive or suggestion. A person of ordinary skill in the art who is attempting to find a method of controlling ants or termites would need to prepare each of the embodiments which falls within the realm of *Toki et al.*'s formula (i) and investigate the properties of each of those embodiments to arrive at compounds which solve the problem. As such, the disclosure of *Toki et al.* -at best- makes it obvious to experiment. "Obvious to experiment" is,

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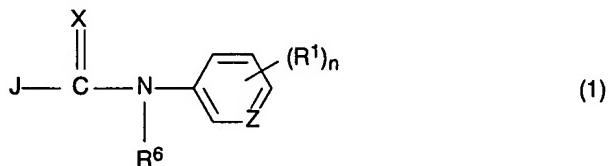
12) ie. page 3, indicated lines 16 to 24 and 41, of EP 500 111.

13) ie. page 3, indicated lines 24 to 37, of EP 500 111.

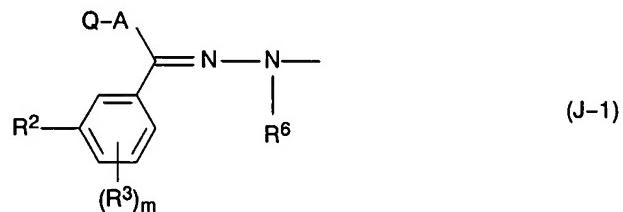
14) ie. In re Napier, 55 F.3d, 610, 613, 34 USPQ2d 1782, 1784 (CAFC 1995): "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination."; In re Geiger, 815 F.2d 686, 688, 2 USPQ2d 1276, 1278 (CAFC 1987); In re Laskowski, 871 F.2d 115, 117, 10 USPQ2d 1397, 1399 (CAFC 1989): "[t]he mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification", quoting In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (CAFC 1984)

however, not a proper standard for obviousness, and selective hindsight is no more applicable to the design of experiments than it is to the combination of prior art teachings. There must be a reason or suggestion in the art for selecting the procedure used, other than the knowledge learned from the applicant's disclosure<sup>15)</sup>. Favorable action is solicited.

The same applies, mutatis mutandis, to where the disclosure of **Harrison et al.** is concerned, which relates to arthropodicidal compounds represented by a generic formula (1)



wherein J inter alia denotes a group of formula J-1



wherein A is inter alia a C<sub>1</sub>-C<sub>3</sub> alkylene, Q denotes inter alia phenyl which is optionally substituted by (R<sup>4</sup>)<sub>p</sub>, R<sup>4</sup> inter alia denotes cyano and p is 0 to 2<sup>16</sup>.

Again, it is possible to construe the compounds of applicants' formula (I-1) by selectively picking and choosing the "right" denotations for the variables. There is however nothing in the teaching of **Harrison et al.** which would guide a person of ordinary skill in the art to make the particular selection which is necessary to arrive at applicants' formula (I-1). Nor is there any exemplary compound disclosed by **Harrison et al.** which identically shows the requirements characterizing the compounds of applicants' formula (I-1). Accordingly, the disclosure of **Harrison et al.** equally fails to identically show the invention which is defined in applicants' claims, and falls short from amounting to an anticipating disclosure within the meaning of Section 102. Since the features and requirements which characterize applicants' formula (I-1) constitute an essential part of each of applicants' Claims 1, 10 and 13 to 17, the claims herewith presented

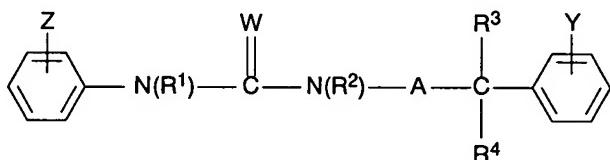
15) In re Dow Chemical Co., 837 F.2d 469, 5 USPQ2d 1529 (CAFC 1988)

16) page 1, indicated line 34, to page 5, indicated line 13, of WO 92/06076.

by applicants are novel over the teaching of *Harrison et al.* It is respectfully requested that the rejection under 35 U.S.C. §102(b) be withdrawn.

Moreover, the disclosure of *Harrison et al.* fails to render applicants' methods *prima facie* obvious within the meaning of Section 103(a) for failing to provide some incentive or motivation which suggests the desirability of the particular changes which are necessary to arrive at the claimed invention<sup>17)</sup>. Similar to the disclosure of *Toki et al.*, the teaching of *Harrison et al.* at best renders it obvious to prepare and test each of the embodiments which falls within the realm of *Harrison et al.*'s formula (1) when attempting to develop a method of controlling ants or termites. Favorable action is solicited.

The Examiner has further rejected Claims 1 to 5 and 8 to 12 under 35 U.S.C. §102(b) as being anticipated by the teaching of *Takagi et al.* (US 5,543,573) which relates to hydrazinecarboxamides represented by formula<sup>18)</sup>



wherein A represents a group<sup>19)</sup>



wherein Y<sup>20)</sup> represents 1 to 5 substituents selected from a group encompassing nitro and cyano. *Takagi et al.* further discloses that the respective compounds are suitable for controlling insect pests.

While *Takagi et al.* inter alia mention representative examples which meet the structural requirements of applicants' formula (I-1), the teaching of *Takagi et al.* fails to identically disclose applicants' invention for failure to teach

- the control of a pest selected from the Isoptera, Hymenoptera, Orthoptera and Psocoptera orders (*Claim 1 et seq.*),

17) ie. footnotes (10) and (11) on page 4 of this paper.

18) ie. col. 1, indicated line 41 et seq., of US 5,543,573.

19) ie. col. 1, indicated line 60 et seq., of US 5,543,573.

20) ie. col. 2, indicated lines 40 to 63, of US 5,543,573.

- the control of a pest selected from the Rhinotermitidae, Termitidae, Kalotermitidae and Termopsidae families (*Claim 15*), or
- the control of a pest selected from the Formicidae family (*Claim 16 et seq.*),

by applying one of the requisite representatives. Accordingly, the teaching of *Takagi et al.* does not amount to an anticipating disclosure within the meaning of Section 102. Favorable reconsideration of the Examiner's position and withdrawal of the rejection of Claims 1 to 5 and 8 to 12 under 35 U.S.C. §102(b) based on the teaching of *Takagi et al.* is therefore respectfully solicited.

Moreover, the teaching of *Takagi et al.* does not render the method defined in applicants' claims *prima facie* obvious within the meaning of Section 103(a) for failing to provide some incentive or motivation which suggests the desirability of the particular changes which are necessary to arrive at the claimed invention<sup>21)</sup>. *Takagi et al.* generically state that the hydrazinecarboxamides are effective against "agricultural insect pests, forest insect pests, horticultural insect pests, stored grain insect pests, sanitary insect pests, nematodes etc"<sup>22)</sup>, and further mentions Lepidoptera, Hemiptera, Coleoptera, Diptera, and Tylenchida<sup>23)</sup>. The cited statement of *Takagi et al.* is by far too general to suggest or imply that any group of compounds within the hydrazinecarboxamides of *Takagi et al.* exhibits a particular effect against

- a pest selected from the Isoptera, Hymenoptera, Orthoptera and Psocoptera orders (*Claim 1 et seq.*),
- a pest selected from the Rhinotermitidae, Termitidae, Kalotermitidae and Termopsidae families (*Claim 15*), or
- a pest selected from the Formicidae family (*Claim 16 et seq.*),

and Lepidoptera, Hemiptera, Coleoptera, Diptera and Tylenchida pests differ considerably from the pests defined in applicants' claims. Accordingly, the teaching of *Takagi et al.* fails to provide for the incentive which is necessary for obviousness under Section 103(a)

(a) to select the particular compounds which fall within the realm of applicants' formula (I-1) from the numerous species which fall within the scope of *Takagi et al.*'s hydrazinecarboxamides, and

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21) ie. footnotes (10) and (11) on page 4 of this paper.

22) ie. col. 62, indicated lines 6 to 11, of US 5,543,573.

23) ie. col. 62, indicated lines 11 to 67, of US 5,543,573.

(b) to apply those particular compounds against a pest selected from the Isoptera, Hymenoptera, Orthoptera and Psocoptera orders, a pest selected from the Rhinotermitidae, Termitidae, Kalotermitidae and Termopsidae families, or a pest selected from the Formicidae family, as required in accordance with applicants' invention.

The subject matter of applicants' claims is therefore deemed to be patentable in light of the teaching of *Takagi et al.* Favorable action is solicited.

The Examiner has rejected Claims 1 to 5 and 8 to 12 under 35 U.S.C. §112, ¶1, as failing to comply with the enablement requirement.

More particularly, the Examiner takes the position that applicants' disclosure is insufficient with regard to the "effective amount" in which the compound of formula (I-1) is to be applied to achieve the control of the pests defined in applicants' claims. The Examiner's attention is respectfully drawn to applicants' disclosure on page 26, indicated lines 18 to 24, of the application where applicants provide that the active ingredient is to be applied in amounts of from 0.1 to 50 g/m<sup>2</sup> when applied to materials, and in amounts of from 1 to 500 g/m<sup>2</sup> when applied to the soil or a nest of the pests in order to be effective. The Examiner's respective position is, therefore, not deemed to be well taken.

The Examiner further argues that the application lacks enablement with regard to formulations in which the compounds are to be applied in applicants' methods and with regard to the manner of application. However, as corroborated by the prior art which was applied by the Examiner under Section 102, the manner in which an active ingredient is formulated and applied is, essentially, conventionally known to a person of ordinary skill in the pertinent art<sup>24)</sup>. It is well settled that an application need not teach, and preferably omits, that which is well known in the art<sup>25)</sup>, and enablement within the meaning of Section 112, ¶1, does not require the recitation of background knowledge in an application. Favorable reconsideration of the Examiner's respective position is, therefore, solicited.

24) Note, for example, page 39, indicated line 15 et seq., and page 43, indicated line 18 et seq., of EP 500 111; page 44, indicated line 6 et seq., page 45, indicated line 31 et seq., and page 56, indicated line 6 et seq., of WO 92/06076; and col. 63, indicated line 25 et seq., of US 5,543,573.

25) Note footnote (4) on page 3 of this paper.

The Examiner further takes the position that enablement is lacking because the application only provides data for tests conducted with one termite. It is well settled that a specification need not contain a working example if the invention is otherwise disclosed in such a manner that one of ordinary skill in the art will be able to practice it without undue experimentation<sup>26)</sup>. To satisfy the requirements of 35 U.S.C. §112, ¶1, the specification disclosure has to be sufficiently complete to enable one of ordinary skill in the art to make the invention without undue experimentation, but the need for routine experimentation is not fatal. Enablement is the criterion, and every detail need not be set forth in the written specification if the skill in the art is such that the disclosure enables one to make the invention<sup>27)</sup>.

Applicants' disclosure provides the person of ordinary skill with the particular structural limitations of the compounds which are prerequisite for the claimed method<sup>28)</sup>, with the amounts in which the particular compounds are to be applied<sup>29)</sup>, and with the pests against which the particular compounds are effective in the specified amounts<sup>30)</sup>. Since applicants' invention does not involve a particular formulation or application technique beyond conventional formulations and application methods, a person of ordinary skill in the art does not have to engage in experimentation beyond routine experiments in order to use applicants' method. Accordingly, the information provided by applicants in the detailed disclosure part of the application is deemed to be fully sufficient to satisfy the requirements of 35 U.S.C. §112, ¶1.

The Examiner's criticism that applicants have not identified the solvent which was used in Test Example 1 is not understood. In tests where the active ingredient is first applied to a material or plant and the material or plant is subsequently inoculated with the tested pest it is standard operating procedure to evaporate solvents before inoculation<sup>31)</sup>. Since standard operating procedure prevents that a

26) ie. In re Borkowski, 422 F.2d 904, 164 USPQ 642 (CCPA 1970) and cases cited therein; In re Marzocchi, 439 F.2d 220, 169 USPQ 367 (CCPA 1971)

27) ie. Martin v. Johnson, 454 F.2d 746, 172 USPQ 391 (CCPA 1972)

28) In particular page 2, indicated line 22, to page 14, of the application.

29) In particular page 26, indicated lines 18 to 24, of the application.

30) In particular page 23, indicated lines 5 to 29, of the application.

31) Note, for example, page 43, indicated line 36, to page 45, indicated line 5, of EP 500 111; page 64, indicated lines 10 to 14, of WO 92/06,076; and col. 65, indicated lines 50 to 60, and col. 71, indicated lines 5 to 12, of US 5,543,573.

solvent effect distorts the results of the tests, the nature of the solvent is of no concern.

In light of the foregoing, it is respectfully requested that the rejection of Claims 1 to 5 and 8 to 12 under 35 U.S.C. §112, ¶1, be withdrawn. Favorable action is solicited.

REQUEST FOR EXTENSION OF TIME:

It is respectfully requested that a three month extension of time be granted in this case. A check for the \$950.00 fee is attached.

Please charge any shortage in fees due in connection with the filing of this paper, including Extension of Time fees, to Deposit Account No. 11.0345. Please credit any excess fees to such deposit account.

Respectfully submitted,  
KEIL & WEINKAUF



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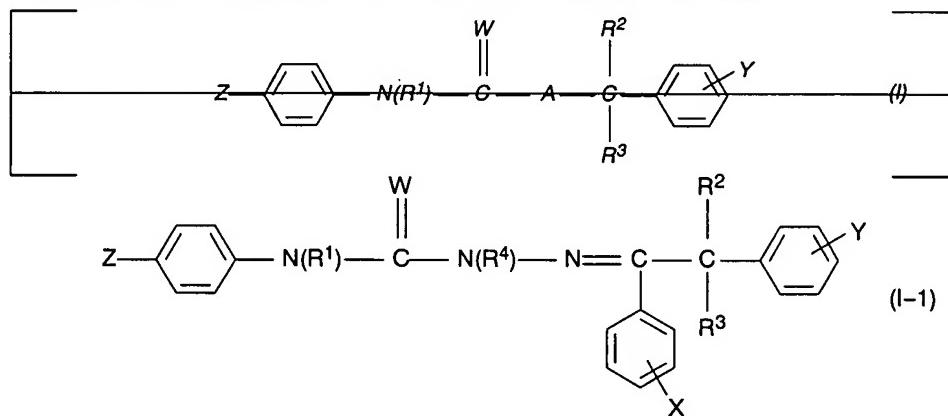
Encl.: THE LISTING OF CLAIMS (Appendix I)  
THE CURRENT CLAIMS (Appendix II)

HBK/BAS

## APPENDIX I:

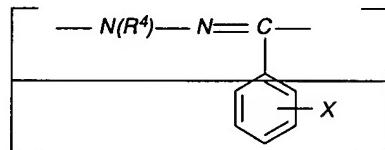
THE LISTING OF CLAIMS (version with markings):

1. (currently amended) A method for [combating] controlling a pest selected from the Isoptera, Hymenoptera, Orthoptera[ $\tau$ ] and Psocoptera orders which comprises applying to said pest or to a wooden part or to soil in the habitat of said pest an effective amount of a hydrazine compound of formula [(I)] (I-1):



wherein

[A represents]

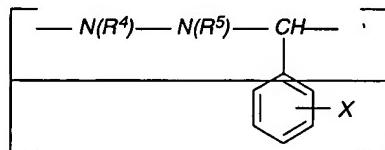


[wherein]

[R4 represents hydrogen or C1-C6 alkyl, and]

[X represents 1 to 5 same or different substituents selected from the group consisting of hydrogen, halogen, C1-C6 alkyl and halo C1-C6 alkyl,]

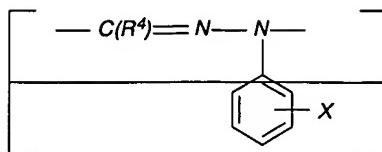
[or is]



[wherein R4 and X are as defined above, and]

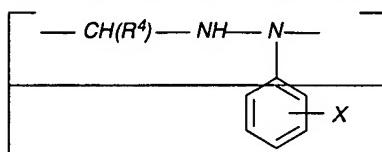
[R5 represents hydrogen, C1-C6 alkylcarbonyl or phenyl carbonyl which may have 1 to 2 same or different C1-C6 alkyl substituents,]

[ər-ɪs]



[wherein  $R^4$  and  $X$  are as defined above, ]

[ərɪs]



[wherein  $R^4$  and  $X$  are as defined above; ]

R<sup>1</sup> represents hydrogen or C<sub>1</sub>-C<sub>6</sub> alkyl;

$R^2$  and  $R^3$ , which may be same or different, represent hydrogen, hydroxyl, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy, C<sub>1</sub>-C<sub>6</sub> alkylcarbonyl or phenylcarbonyl;

R<sup>4</sup> represents hydrogen or C<sub>1</sub>-C<sub>6</sub> alkyl;

X represents 1 to 5 same or different substituents selected from the group consisting of hydrogen, halogen, C<sub>1</sub>-C<sub>6</sub> alkyl and halo C<sub>1</sub>-C<sub>6</sub> alkyl;

**Y** represents 1 to 5 same or different substituents selected from the group consisting of [hydrogen, halogen,] nitro and cyano;

**Z** represents halogen, cyano, C<sub>1</sub>-C<sub>6</sub> alkyl, halo C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy, halo C<sub>1</sub>-C<sub>6</sub> alkoxy, halo C<sub>1</sub>-C<sub>6</sub> alkylthio, halo C<sub>1</sub>-C<sub>6</sub> alkylsulfinyl or halo C<sub>1</sub>-C<sub>6</sub> alkylsulfonyl; and

W represents oxygen or sulfur.

2. (canceled)

3. (canceled)

4. (canceled)

5. (canceled)

6. (canceled)

7. (canceled)

8. (canceled)

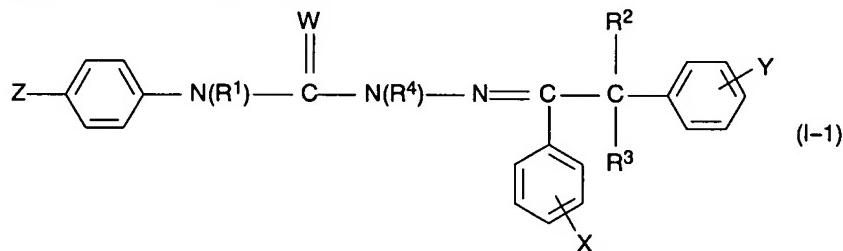
9. (canceled)

10. (current)

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~~effective to protect the wood against pests] of 0.1 to 50 g/m<sup>2</sup>, to a pest selected from the Rhinotermitidae, Termitidae, Kalotermitidae[τ] and Termopsidae [and Formicidae] families.~~

11. (canceled)
12. (canceled)
13. (new) The method of claim 1, wherein R<sup>1</sup> to R<sup>4</sup> each denote hydrogen, X is trifluoromethyl, Y is cyano, Z is trifluoromethoxy, and W is oxygen.
14. (new) The method of claim 1, wherein the pest is an ant or a termite.
15. (new) A method for protecting houses or an article selected from construction materials, furniture, leather, fibers, vinyl articles, electronic wires and cables against a pest selected from the Rhinotermitidae, Termitidae, Kalotermitidae and Termopsidae families, which comprises applying an effective amount of a hydrazine compound of formula (I-1):



wherein

R<sup>1</sup> represents hydrogen or C<sub>1</sub>-C<sub>6</sub> alkyl;

R<sup>2</sup> and R<sup>3</sup>, which may be same or different, represent hydrogen, hydroxyl, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy, C<sub>1</sub>-C<sub>6</sub> alkylcarbonyl or phenylcarbonyl;

R<sup>4</sup> represents hydrogen or C<sub>1</sub>-C<sub>6</sub> alkyl;

X represents 1 to 5 same or different substituents selected from the group consisting of hydrogen, halogen, C<sub>1</sub>-C<sub>6</sub> alkyl and halo C<sub>1</sub>-C<sub>6</sub> alkyl;

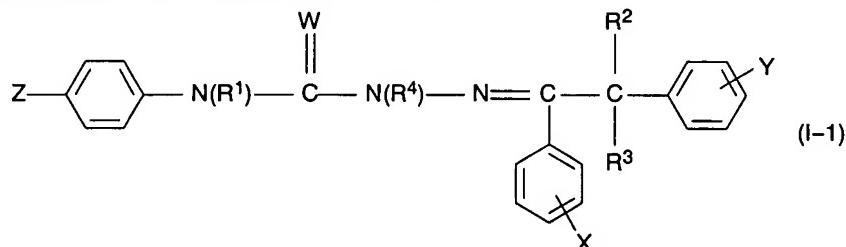
Y represents 1 to 5 same or different substituents selected from the group consisting of nitro and cyano;

Z represents halogen, cyano, C<sub>1</sub>-C<sub>6</sub> alkyl, halo C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy, halo C<sub>1</sub>-C<sub>6</sub> alkoxy, halo C<sub>1</sub>-C<sub>6</sub> alkylthio, halo C<sub>1</sub>-C<sub>6</sub> alkylsulfinyl or halo C<sub>1</sub>-C<sub>6</sub> alkylsulfonyl; and

W represents oxygen or sulfur,

to said pest, a habitat or a nest of said pest, to a place at which occurrence of said pest is expected or to the article.

16. (new) A method for controlling a pest from the Formicidae family in crops, which comprises applying an effective amount of a hydrazine compound of formula (I-1):



wherein

R<sup>4</sup> represents hydrogen or C<sub>1</sub>-C<sub>6</sub> alkyl, and

X represents 1 to 5 same or different substituents selected from the group consisting of hydrogen, halogen, C<sub>1</sub>-C<sub>6</sub> alkyl and halo C<sub>1</sub>-C<sub>6</sub> alkyl,

R<sup>1</sup> represents hydrogen or C<sub>1</sub>-C<sub>6</sub> alkyl;

R<sup>2</sup> and R<sup>3</sup>, which may be same or different, represent hydrogen, hydroxyl, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy, C<sub>1</sub>-C<sub>6</sub> alkylcarbonyl or phenylcarbonyl;

Y represents 1 to 5 same or different substituents selected from the group consisting of nitro and cyano;

Z represents halogen, cyano, C<sub>1</sub>-C<sub>6</sub> alkyl, halo C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy, halo C<sub>1</sub>-C<sub>6</sub> alkoxy, halo C<sub>1</sub>-C<sub>6</sub> alkylthio, halo C<sub>1</sub>-C<sub>6</sub> alkylsulfinyl or halo C<sub>1</sub>-C<sub>6</sub> alkylsulfonyl; and

W represents oxygen or sulfur.

to said pest, to said crops, to soil surrounding said crops or to a nest of said pest.

17. (new) The method of claim 16, wherein the hydrazine compound is applied in an amount of from 1 to 500 g/m<sup>2</sup>.